

Biodegradable packaging developed for organic beauty market

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Credit: Heriot-Watt University

New, biodegradable packaging has been developed to help cosmetics firms meet customers' demand for environmentally-friendly packaging.

The new packaging solves a conundrum for cosmetics firms that currently sell organic, 'clean' products in [plastic containers](#) made from fossil fuel products that cannot degrade and will forever remain in

landfill.

Toxicologists from Heriot-Watt University in Edinburgh worked with partners across Europe on the BioBeauty project to develop the biopackaging, which offers the same environmental credentials as the products it contains.

The BioBeauty consortium comprised eight partners from five different countries: Spain, Scotland, Slovenia, the Netherlands and France. The partners are ITENE, Heriot-Watt University, Miniland, Alissi Brontë, Alan Coar, Vitiva, Martin Snijder Holding BV and ETS Bugnon.

Dr. Helinor Johnston, associate professor of toxicology at Heriot-Watt said: "The organic beauty market is huge. In the UK, it was valued at £85.8 million in 2018, and it is expected to have a global value of 54.5 billion (USD) within the next 10 years.

"The new packaging is made from [polylactic acid](#) (PLA), which can be obtained from renewable resources like corn starch or sugar cane, and is compostable and biodegradable.

"Polylactic acid (PLA) was selected as the plastic for the new packaging, but in order to improve the performance of this plastic, and to increase the shelf life of the cosmetic product, we had to incorporate two different materials.

"We added nano clays, which improve the barrier properties of the product, and a rosemary extract which acts as an antioxidant to protect the cosmetic product from degradation.

"As toxicologists, we know that even [natural ingredients](#) like rosemary can be toxic in the right dose. At Heriot-Watt we tested the toxicity of the rosemary extracts and different types of nano clays to select the least

toxic candidates for the final product, to ensure it is safe for consumers.

"We focused on assessing potential harmful impacts on the skin, but also looked at the response of target sites like the liver and immune system.

"We had to establish the toxicological profile of the individual components, as well as the potential risk to the consumer from any migration of the packaging components of the final product.

"We're creating better ways to test products ethically. As part of this project, we used artificial skin to provide a more comprehensive assessment of how the packaging might react with skin."

The team believes the new biopackaging has huge potential in the cosmetics market.

Dr. Johnston said: "Brands that develop natural and organic products need packaging that aligns with their philosophy and consumer demand for more environmentally-friendly packaging that reduces waste.

"This is a huge opportunity for the industry to gain a [competitive advantage](#)—a recent survey showed that over 70 percent of European consumers would be willing to pay more for greener [packaging](#)."

More information: This project received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 606508. For more information, visit www.biobeautyproject.eu/.

Provided by Heriot-Watt University

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